Site Reassessment Report

Cleveland Hopkins International Airport
Cleveland, Ohio

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
Emergency Response Branch Region 5
77 West Jackson Boulevard
Chicago, IL 60604

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Executive Summary

This Site Reassessment was completed by TN & Associates, Inc. (TN&A) under the STN Environmental Joint Venture Superfund Technical Assessment and Response Team (START) contract EP-S5-06-03. The U.S. Environmental Protection Agency (U.S. EPA) had tasked START under Technical Direction Document S05-0701-011, to reassess three areas at the Cleveland Hopkins International Airport (CHIA) that were identified to have historic releases to the environment.

CHIA is an active airport facility that has been in operation since 1925. Hazardous materials present at the facility primarily consist of jet fuel, de-icing material, paint wastes, and cleaning solutions.

In March of 1988, the Ohio Environmental Protection Agency (OEPA) first investigated an area in the southwestern portion of the property after television news alleged that drums of hazardous waste had been illegally buried there by airport personnel. This area became known as the Excavation Site. Approximately 148 drums, partially filled with paint waste were uncovered during the investigation. These drums and contaminated soils were removed in the summer of 1990.

During the course of the investigation of the Excavation Site, OEPA's Special Investigations Unit personnel gathered further information which led to the identification of two other areas of concern at the airport - the NASA Ravine and the Burn Pit. On September 30, 1991, Ohio EPA issued the Director's Final Findings and Orders for CHIA (Ohio EPA ID # OHD076755081). A fourth area of the site was identified (a second burn pit) during public meetings. The City of Cleveland elected to address the fourth area of the site under the same order of September 30, 1991.

The NASA Ravine was found to contain de-icing materials, drums and construction debris. The Burn Pit is an area where jet fuel was purposely spilled and set on fire to train the airport fire fighting teams.

Both OEPA and U.S. EPA have environmental sampling data on these four areas documenting the releases.

Groundwater Pathway

Groundwater is not currently a source of drinking water in the general area. Off-site water wells do not appear to be using the aquifer that may be impacted by the Sites. The groundwater pathway is considered a low risk.

Surface Water/Sediments Pathway

The potential for an upstream source of contamination for these tributaries, therefore, would be primarily the operations conducted at the CHIA facility. Surface water goes off-site through the drainage system of the airport and groundwater is very limited across the CHIA property due to

the shale bedrock found on site. Therefore, the surface water pathway is considered a low risk.

Soil Pathway

The extent of soil contamination in these areas was defined and the contaminated soils were excavated and removed from the site in the mid 1990s. In order to comply with FAA security regulations, the CHIA property is fenced and the fence is checked frequently for breaches and hence trespassers coming into contact with on-site soils are highly unlikely. Therefore, the soil pathway is considered a low risk.

Air Pathway

A site air survey was performed for the *Revised Human Health Risk Assessment Cleveland Hopkins International Airport Burn Pit Area* in July 1994, and no contaminants of concern were detected during the survey. The primary concern for air contamination would be from on-site fugitive dust. Contaminated soils in the areas of concern have been removed from the site during remedial projects so exposure to contaminated air/dust is unlikely. Therefore, the air pathway is considered a low risk.

Site Description and History

CHIA is located on the west side of the City of Cleveland, Ohio, in Cuyahoga County. It encompasses a total area of 1,900 acres. The surrounding property is primarily industrial and commercial, with some residential properties to the east.

The 1,000-acre property has been owned by the City of Cleveland since 1913 and CHIA has been in operation since 1925. The site is currently occupied by an active airport facility and its vendors. Since the time the historic releases (approximately 1988) were reported, CHIA has undergone several expansions and is currently undergoing another runway expansion.

Ohio EPA issued Director's Final Findings and Orders (DFF&Os) on April 28, 1988 in order to implement further investigation and remedial action of the drum Excavation Site. A preliminary assessment (PA) report was completed by Ohio EPA on September 26, 1990. At that time, the site was assigned a low priority for additional state activities and No Further Remedial Action Planned (NFRAP) determination for Field Investigation Team (FIT) activities.

Amended DFF&Os were issued on September 30, 1991. The orders rescinded the original Division of Hazardous Waste Management (DHWM) Order from 1988 and identified three sites: the drum Excavation Site, the fire training burn pit, and the ravine dumping site. The orders identified that the drum excavation site required a (Resource Conservation Recovery Act) RCRA closure. The orders also required the setup of performance standards for a Remedial Investigation/Feasibility Study (RI/FS) and the Remedial Design/Remedial Action (RD/RA) for both the ravine and burn pit.

On March 3, 1992, U.S. EPA tasked PRC Environmental to conduct a site reconnaissance. A low priority SI was recommended due to a settlement agreement between the City of Cleveland, CHIA and Ohio EPA that would have resulted in a full remedial investigation of the site, with Ohio EPA oversight.

Ohio EPA contacted U.S. EPA in November 1992 to request PRC Environmental be tasked to re-evaluate the site since they believed there were files that had not been uncovered since the last evaluation such as files regarding drum disposal located in U.S. EPA's Westlake Ohio offices. By July 1996, Ohio EPA classified the current status of the site as under RI/FS/RD/RA Orders.

In April 1999, the City of Cleveland-Port Control requested termination of the Amended DFF&Os. An Ohio EPA memo detailed the rationale for granting the request:

- DHWM supervised the RCRA closure of the excavation area and gave the city a closure certification letter; the Division of Emergency and Remedial Response (DERR) provided oversight of the RI/FS for both the burn pit and the ravine;
- both sites met risk assessment standards and were given approval letters for the No Further Action (NFA) designation; and
- the City of Cleveland investigated and conducted a voluntary removal of the

second fire training burn pit during the construction of Concourse D of the airport.

Ohio EPA terminated the Amended DFF&Os on May 20, 1999.

RCRA Concerns

On September 11, 1989, City of Cleveland submitted a closure plan for the Excavation Site and on May 29, 1990, Ohio EPA notified the City that the closure plan had deficiencies.

By May 1998 the site coordinator stated the closure had not yet been completed for the Excavation Site. The Excavation Site was undergoing Voluntary Action Program (VAP) investigations for 6 areas to transfer to adjacent city of Brook Park. At that point, no NFA designations for the Site had been issued. The acreage and locations with respect to the airport are unknown.

RCRA closure activities were conducted at the site pursuant to OAC 3745-66-10 and all applicable closure regulations. A closure certification report submitted by the City of Cleveland was approved by Ohio EPA on April 26, 1999.

Burn Pit. Between 1983 and 1987 one area located in the southwest part of CHIA had been used for routine fire training and fire-fighting practice activities for airport crash, fire, and rescue personnel. This area consists of a burn pit measuring approximately 100 feet wide by 200 feet long. The pit was constructed as a shallow excavation (1-2 feet deep) and berms were constructed around 3 sides of the pit using the excavated soil. As part of Federal Aviation Administration (FAA) required fire training, jet fuel and/or kerosene were placed in the pit, lit on fire and extinguished. Although jet fuel was predominately used, gasoline and diesel fuel were also used in these training exercises. The second burn pit was in use sometime between 1965 and 1995. This burn pit measured approximately 75 feet wide by 75 feet long.

Past investigations at the site included an assessment of subsurface contamination and a Human Health Risk Assessment. Under the Orders issued by OEPA, the Ohio Division of Emergency and Remedial Response (DERR) oversaw contaminated soil excavation from both burn pits. These areas were backfilled with clean soils. The smaller of the two burn pits is now located under Concourse D of the CHIA, and the other is an open field.

Ravine Site. Two closely spaced ravines in the southwest portion of the CHIA property were filled in during expansion activities. A field investigation by OEPA discovered that waste materials had been disposed off in the ravines, primarily consisting of construction debris, empty 55-gallon drums, and various other containers. Labeling on the containers indicated that the contents were primarily sealants or hydraulic oil. These containers were removed from the area

and a Phase I Remedial Investigation (RI) was performed during 1995 and a report was submitted in July 1996. The findings of the Phase I RI indicated that no further action was required. All work conducted at the Ravine Site was overseen by DERR personnel.

Excavation Area. On March 10 and 11, 1988, CHIA personnel placed 148 drums, mostly empty, in a disposal pit located on the southwestern side of CHIA property. This pit was approximately 100 feet wide by 200 feet long. These drums were removed from the pit during the period of March 17 through 29, 1988. These drums were then staged at the site and disposed off in April 1990. These removal activities conducted at the site was regulated by DHWM personnel and was part of a RCRA closure, pursuant to OAC 3745-66-10. CHIA submitted a RCRA closure certification report to OEPA which was reviewed and approved in 1999. Currently this area is undergoing a runway expansion.

Pathway Analysis

Ground Water Migration Pathway

Hydrogeology. The geology of the area consists of lake clays (silty clay) to a depth of approximately 200 feet except in the area of the NASA Ravine. The NASA Ravine has areas of fill material (primarily brown and gray silty clay with smaller amounts of sand, gravel, cinders, brick, vegetation and decayed organic material). The fill depth ranges from 3 feet in the area near the ravines to 33 feet in the ravines themselves. Shale bedrock is encountered near the Ravine Site at approximately 41 feet below the ground surface.

Groundwater at the site likely occurs in two distinct zones: one in the shale bedrock and the other in laterally discontinuous, seasonal perched lenses. The average depth to groundwater is 90 feet below the ground surface. The wells in the clay yield less than 2 gallons per minute and wells in the shale bedrock yield 3-4 gallons per minute.

Groundwater in the Burn Pit Area, as stated in the *Preliminary Assessment of Subsurface Contamination at Cleveland Hopkins International Airport Burn Pit* is "generally considered unavailable and not a source of drinking water in the general area."

Ravine Site groundwater appears to be similar to the Burn Pit Area. No information could be found about the groundwater at the Ravine Site in the Phase I Ravine Site Remedial Investigation Report.

In the Excavation Site, groundwater appears to be flowing both northeasterly and southwesterly directions away from the Excavation Site.

Potential for Release to Ground Water. Groundwater is considered unavailable and not a source of drinking water in the general area. The airport and the surrounding communities, with the exception of Berea, are serviced by the City of Cleveland's central water supply system, which draws water from Lake Erie. The City of Berea has its own water treatment and distribution system, which draws water from the Rocky River through the Baldwin Lakes, which are approximately two miles upstream of the airport.

Potential Drinking Water Targets. Within approximately three miles of the site, the areas in which residential wells are currently in use reportedly include: (1) one-half of the City of Olmstead Falls; (2) one-fourth of the area of Olmstead Township, located outside of the corporate boundaries of Olmstead Falls and North Olmstead; and (3) one or two wells along Fry Road in Middleburg Heights. When conducting a well log search at the Ohio Department of Natural Resources website http://www.dnr.state.oh.us/water/maptechs/wellogs/appNEW/center.aspx and conducting a 2-mile radius search from the latitude and longitude of the of the

area near the southern most site at the Cleveland Hopkins International Airport, 87 well logs were shown to be located within the 2-mile radius in the Olmsted, Middleburg, Rockport and Dover Townships. When conducting a 1-mile radius search, 11 wells were shown. There were no wells that were shown <1/2 mile of the airport location. On the U.S. Census website for the zip code of the Airport as 44135, the population density is 2.31. Therefore, the population for the 2-mile radius is 201, and the 1-mile radius is 25.4.

Drinking Water Threat. The threat to potable use water wells is low because of the following: all of the above referenced locations are upgradient and in locations hydrogeologically secluded from the site. Furthermore, the primary aquifer in a majority of the off-site well locations is the Mississippi-age Berea Sandstone. Stratigraphically, the Berea Sandstone is located above the Mississippian-Devonian shale which is present in the area of the site. Off-site water wells do not appear to be using the aquifer that may be impacted by the site.

Surface Water/Sediment Pathway

Hydrology. The primary surface water bodies near the CHIA facility include Rocky River, Abram Creek, and two unnamed tributaries. Although CHIA is not directly in contact with Rocky River, two of the stormwater outfalls from the northwestern portion of the CHIA discharge to the Rocky River. The portions of Abram Creek and the unnamed tributaries which border the CHIA site are located in relatively narrow, steep-sloped valleys which have cut through the surficial soils and into the bedrock. The typical water level in these streams is generally 30 to 40 feet below the CHIA site surface. The 100-year flood plain lies within these steep valley walls as they cut through the CHIA facility. Due to the depth of the stream valleys and the differences in elevation between the stream beds and the facility, significant flooding of any portion of the facility outside of the 100-year flood plain is considered unlikely.

The closest surface water body is Abrams Creek. It is approximately 950 feet from the drum Excavation Site area and ½ mile away from the fire training burn pit. The Ravine Dumping Site lies on a branch of Abrams Creek but is not accessible to the public. The ravine flows into the creek ¼ mile away. Abrams Creek, a main tributary of the Rocky River, merges with the river 3.3 miles downstream. The river drains into Lake Erie 8.1 miles downstream. The city of Cleveland uses 5 intakes from Lake Erie that are between 2.5 and 4 miles offshore. Local residents obtain their drinking water from this municipal water system. However, the city of Berea obtains its drinking water from Lake Baldwin, located 2 miles upstream of the site. Abrams Creek is considered a primary fishery. Rocky River is considered a secondary fishery and is a well-known recreational area. No sensitive environments exist within the 15-mile target distance limit (TDL).

Abram Creek originates in a low-lying area south of CHIA and exits onto the

NASA LeRC facility at its western boundary. The stream flows through a heavily industrialized portion of Cuyahoga County. The two smaller unnamed tributaries are located in the southwestern portion of the CHIA facility which eventually meet and subsequently flow into Abram Creek. The sources of these two unnamed tributaries are stormwater outfalls located on the southwestern portion of the CHIA facility. The potential for an upstream source of contamination for these tributaries, therefore, would be primarily the operations conducted at the CHIA facility.

At the time of the PA, it was observed that dead vegetation and frogs occurred in and around the ravine dumping site. US EPA files do not have the RI/FS reports supervised by Ohio EPA in the 1990s to evaluate, if any, the impacts to the ravine. It is assumed that the site poses little threat to surface water since Ohio EPA assigned a NFA designation.

Potential for a Release to Surface Water. The storm sewer outfalls at the head of the unnamed tributaries represent potential entry points for contaminants from the CHIA facility and impact the unnamed tributaries and ultimately Abram Creek and Rocky River. The storm sewer system at CHIA collects storm water from surface water runoff, roof drains, foundation drains, and paved area underdrains. Most of the precipitation in the Ravine areas is believed to flow overland, although several low volume groundwater seeps were observed along the unnamed tributary walls following periods of rainfall during a Phase 1 Remedial Investigation.

Drinking Water Targets and Threat. The nearest drinking water intake from the surface waters near CHIA is the City of Berea. The City of Berea has its own water treatment and distribution system, which draws from the Rocky River through the Baldwin Lakes, which are approximately two miles upstream of the airport.

Human Food Chain Threat. The CHIA implements various actions to prevent wildlife within the airport vicinity for the safety of the airplanes, including a fence completely surrounding the property and routine wildlife dispersion activities. Access to the CHIA is also highly restricted due to security issues. This limits the human food chain threat. Also, a risk assessment was conducted for each of the sites, all of which stated that there was no human health risk from any of the sites. Therefore, the human food chain risk is considered low.

Environmental Targets and Threat. As stated above, a fence and dispersion activities restrict all forms of wildlife from entering the CHIA property. Access is also highly restricted to the airport property. Risk assessments conducted for all three sites indicate that there is no risk associated with any of the sites. Surface water goes off-site through the drainage system of the airport and groundwater is very limited across the CHIA property due to the shale bedrock found on site. Therefore, the threat to environmental targets is considered low.

Soil Exposure Pathway

Soil Type. CHIA lies within the Lake Plain sub-province of the Central Lowlands physiographic province. Two general types of geologic formations underlie the site: the consolidated rocks- the uppermost formation, which consists of Devonian-age shales, and the overlying, unconsolidated clays, silts, and sands of glacial origin. The upper surface generally consists of lacustrine silts and clays with some sandy zones. Natural geologic conditions at the site, specifically a 13 to 15-foot thick layer of dense silty clay till that underlies the site (starting at a depth of approximately 5 feet) would impede any migration of contaminants.

Land-Use. The properties to the east and south of CHIA consist primarily of industrial and commercial properties, while residential areas exist to the north and west. There are no agricultural areas nearby.

Potential for a Release to Soil. Site assessments at each of the three locations in question have verified that releases directly to the soil had occurred in the past. The extent of soil contamination in these areas was defined and the contaminated soils were excavated and removed from the site in the mid 1990s.

Potential Soil Targets and Threats. CHIA is an active airport that conducts operations 24 hours a day. In order to comply with FAA security regulations, the CHIA property is fenced and the fence is checked frequently for breaches and hence trespassers coming into contact with on-site soils are highly unlikely. Since the majority of the airport personnel perform their duties either inside the airport or on concrete covered runways, exposure to the soil by CHIA personnel would be limited.

An airport expansion has occurred in one of the Burn Pit areas. This Burn Pit area is now paved and used as an airport runway and Concourse D, thereby eliminating soil exposure threats. The other Burn Pit area and the Ravine Site has been remediated and backfilled with clean soils therefore, eliminating potential soil contact/exposure threats. A runway expansion is currently in progress in the Excavation Area; therefore that area will be paved over also. Scenarios where CHIA workers would encounter on-site soils would include lawn maintenance personnel or construction workers for expansion projects. Therefore, the threat to environmental targets is considered low.

When conducting a search of schools and day care facilities using Yahoo Local, schools and day care facilities were found over a mile away from the CHIA address. All of the school and day care facility locations are found to be east and north of the CHIA property. Using Landview Software of the U.S. Census Bureau, it is determined that 2,450 residents live within 1-mile of the sites located from the southwest corner of the CHIA property.

Air Pathway

During the time when the CHIA Burn Pit was in use, air contamination probably occurred; however since no monitoring or sampling was performed during those training exercises, there is no evidence to support this.

A site air survey was performed for the *Revised Human Health Risk Assessment Cleveland Hopkins International Airport Burn Pit Area* in July 1994, and no contaminants of concern were detected during the survey. In addition, headspace readings on soil samples that were collected did not indicate that volatile organic compounds were being released to the environment from the soil. The primary concern for air contamination would be from on-site fugitive dust.

Contaminated soils in the areas of concern have been removed from the site during remedial projects so exposure to contaminated air/dust is unlikely.

Site Conclusion

Each of the sites had risk assessments conducted. Those risk assessments showed no risk to human health. Access to the CHIA is highly restricted due to security issues. CHIA employees would primarily be working at the terminal or along the concrete runways and taxiways. CHIA also maintains routine wildlife dispersion activities to prevent wildlife from entering the CHIA property.

This site does not pose a risk to human health or the environment surrounding the CHIA property. The three areas have been remediated so that there is no human health risk. Also some areas, such as the Burn Pit Site area and Excavation Site area appears to have been under construction to have more of the area excavated and then paved over with concrete as part of runway and terminal expansions.

Groundwater Pathway

Groundwater is not currently a source of drinking water in the general area. Off-site water wells do not appear to be using the aquifer that may be impacted by the Sites. The groundwater pathway is considered a low risk.

Surface Water/Sediments Pathway

The potential for an upstream source of contamination for these tributaries, therefore, would be primarily the operations conducted at the CHIA facility. Surface water goes off-site through the drainage system of the airport and groundwater is very limited across the CHIA property due to the shale bedrock found on site. Therefore, the surface water pathway is considered a low risk.

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References

All the following documents were used in the preparation of this report. These documents were obtained from the Ohio EPA's project files.

Department of Airport Relations and Community Relations, Fall/Winter 2005 Newsletter, City of Brook Park, Ohio.

Interoffice Communication from Laura Fay, Ohio EPA DEER to Jeanne Griffin, U.S. EPA dated November 24, 1992

Memorandum from PRC Environmental Management to Jeanne Griffin about recommendation for site dated September 9, 1992.

Ohio EPA Interoffice Memorandum regarding Termination of Amended Director's Final Findings and Orders dated May 20, 1999.

Ohio EPA Preliminary Assessment for Cleveland Hopkins International Airport dated September 20, 1999

OhioEPA: Ohio Voluntary Action Program: Annual Report to Ohio Legislature, July 1998-June 1999, pg 4. www.epa.state.oh.us/derr/vap/docs/1999Report.pdf

Ohio EPA Amended Director's Final Findings and Orders dated September 30, 1991

R & R International, Inc. *Phase I Ravine Site Remedial Investigation Report,* July 26, 1996.

Woodward-Clyde, *Initial Groundwater Monitoring Report, Excavation Site, Cleveland Hopkins International Airport,* August 19, 1993.

Woodward-Clyde, *Initial Soil Assessment Report, Excavation Site, Cleveland Hopkins International Airport,* August 19, 1993.

Woodward-Clyde, *Phase II Soil Assessment Report, Excavation Site, Cleveland Hopkins International Airport,* December 7, 1993.

Woodward-Clyde, *Risk Assessment, Excavation Site, Cleveland Hopkins International Airport,* February 2, 1994.

Woodward-Clyde, *Revised Closure Plan, Excavation Site, Cleveland Hopkins International Airport,* July 27, 1992.

Woodward-Clyde, *Final Report, Revised Human Health risk Assessment, Cleveland Hopkins International Airport, Burn Pit Area.* July 1994.

Woodward-Clyde, *Preliminary Assessment of Subsurface Contamination at Cleveland Hopkins International Airport, Burn Pit.* November 1988.

Foster Wheeler Environmental Corporation, *Work Plan Excavation and Monitoring at Five-Points Burn Pit, Cleveland Hopkins International Airport.*

Site:	Cleveland Hopkins International Airport
Date:	December 3, 2007
Photographer:	Stephen Wolfe
Photo Number:	1
Comment	A view of the current conditions at the Burn Pit Area, Concourse "D".

Site:	Cleveland Hopkins International Airport
Date:	December 3, 2007
Photographer:	Stephen Wolfe
Photo Number:	2
Comment	A view of the current conditions at the Burn Pit Area.

Site:	Cleveland Hopkins International Airport
Date:	December 3, 2007
Photographer:	Stephen Wolfe
Photo Number:	3
Comment	A view of the former Excavation Site. Currently undergoing a runway expansion.

Site:	Cleveland Hopkins International Airport
Date:	December 3, 2007
Photographer:	Stephen Wolfe
Photo Number:	4
Comment	A view of the current conditions of the Ravine Area.